

DETERMINANTS OF COMPETITIVENESS OF SMALL-SCALE INDUSTRIES IN INDIA¹

M.R. Narayana

Institute for Social and Economic Change, Bangalore

This paper is focused on analysis of quality and cost of infrastructure facilities and business environment, and their impact on competitiveness of India's Small-Scale Industries (SSIs). Infrastructure facilities include transport, market information, credit, power, water, telecom, technology upgradation and quality certification. Quality of business environment is indicated by duration of delay in obtaining Governments permissions and clearances. The analysis is based on both primary and secondary data. Primary data were collected from a sample survey of 373 SSIs in Bangalore and non-Bangalore regions of Karnataka State. The results show that low quality and high cost transport facilities, power, water supply; lack of market information; inadequate credit facility; and low technology have lesser effects on competitiveness of SSIs in Bangalore region than in other regions. In addition, extent of delay varies between regions in getting credit sanctioned from banks, getting tax and duty-drawbacks, getting temporary and permanent registration, clearances for exports, permission for expansion and diversification, power and water connections, and clearance from pollution control. A comparison of these results with the World Bank's Business Environment Survey results for India and China shows important factors that

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affect global competitiveness of SSIs in the State. Thus, improvement in these factors will contribute to enhancing and strengthening of global competitiveness of SSIs. Subject to the comparability of economic structure, the analysis and results of this study are of relevance and applicability for other developing countries in the world.

Competitiveness is a multi-dimensional concept. This is evident, for instance, in the analysis of its nature, types and levels in manufacturing industries and trade by [Kathuria \(1995\)](#), [Narayana \(1993\)](#), [National Productivity Council \(1999\)](#), [Siggel \(2001\)](#), [Government of India \(2002\)](#), [Banwet et al. \(2002\)](#) and [Gowswami & Dollar \(2002\)](#). Throughout this paper, however, competitiveness describes the ability of Small-Scale Industries (SSIs) to generate income/output and maintain employment levels in the face of domestic and global competition.² Consequently, in the absence of competitiveness, SSIs may face the problem of sickness or closure.³ Hence, all policy efforts to enhance and

² In general, no formal definition of competitiveness is provided, even in the classic survey article by [McGreehan \(1968\)](#). Thus, competitiveness is described and measured with respect to select indicators and indices. This is evident, for instance, in (a) current and growth competitiveness indices by the [World Economic Forum \(2000\)](#), (b) index of economic performance, government efficiency, business efficiency and infrastructure in the World Competitiveness Yearbook by the International Institute for Management Development (<http://www02.imd.ch/wcy/>), (c) competitiveness indicators by the World Bank (<http://wbIn0018.worldbank.org/psd/compete.nsf>); and (d) trade performance and competitiveness in [RIS \(2004\)](#).

³ Sickness is used in the policy documents and discussions in India. For instance, the All India Census of Small Scale Industries 2001-02 ([Government of India 2003a](#)) has adopted three criteria for identifying sickness: First, continuous decline in gross output over three consecutive financial years. Second, delay in repayment of institutional loans by more than 12 months. Third, erosion in net worth due to accumulated losses to the extent of 50 percent

strengthen competitiveness will have implications for preventing both sickness and closure of SSIs.⁴

Policy literature on India's SSIs in post-WTO includes [Government of India \(1997\)](#), [SIDBI \(2001\)](#) and [Government of India \(2001\)](#).⁵ These studies do emphasise the role of infrastructure and business environment for the growth and competitiveness of SSIs. However, these studies were carried out at a national level of aggregation. Given the importance of sub-national level planning for industrial development in general, and for development of SSIs in particular, there is a policy need to carry out regional (or State level) and intra-regional (or intra-State) study on determinants of competitiveness in India. This type of studies will have the potential to deliver policy implications to correct for inter-regional imbalances, because they are related to competitiveness of SSIs.

of its net worth during the preceding accounting year. A sick unit under the first criterion is called an incipiently sick unit. A unit that satisfies the second or third criterion is called a sick unit.

⁴ For instance, the Quick Results of the All India Census of Small-Scale Industries 2001-02 ([Government of India 2003a](#)) show that the main reasons for sickness include lack of demand, working capital problems, marketing problems, power shortage, non-availability of raw materials and equipment problems. A random sample survey of registered SSIs in 2000-01 for Karnataka State showed that the most important reasons for closure of SSIs in Karnataka State were marketing problems, financial problems and lack of competitiveness (or could not survive in competition). The survey results are detailed in [Narayana \(2003a\)](#).

⁵ Throughout this paper, a small-scale industry is defined according to the investment limit of the Government of India. In general, an industrial undertaking in which the investment in fixed assets in plant and machinery, excluding land and building, whether held on ownership terms or on lease or on hire purchase, does not exceed Rs.10 million is called a small scale manufacturing unit. However, at present, 41 manufacturing activities (mostly in the textiles and garment sector) have an upper investment limit of Rs.50 million. Composition of SSIs and lists of eligible and ineligible manufacturing categories under SSI definition, are available at <http://ssi.nic.in/Information%20about%20SSI%20Units.htm>.

The main objective of this paper is to analyse the determinants of competitiveness of India's manufacturing SSIs in terms of quality and cost of infrastructure facilities, and quality of business environment. Infrastructure facilities are related to transport, market information, credit, power, water, telecom, technology upgradation and quality certification. Business environment is assessed by extent of delay in obtaining Government's permissions and clearances. In reality, infrastructure facilities and business environment have many components. They need to be identified and singled out as determinants of competitiveness. Further, in a large developing country such as India, with infrastructure being provided largely by the regional (or State) governments, there exist considerable intra-regional variations in quality and cost of infrastructure facilities. Thus, the analysis is carried with a regional focus to capture intra-regional variations in determinants of competitiveness.

The analysis in this paper is based on both primary and secondary data. Primary data were collected from a random sample survey of 373 SSIs in Karnataka State. Throughout, Karnataka State is the focus of regional and intra-regional analysis. However, generality of results for India as whole is emphasised.

The analyses in this paper are intended to derive policy implications for enhancing and strengthening of national and global competitiveness of SSIs by way of supplying high quality and low cost infrastructure facilities, and by improving business environment. In addition, a comparison between the results of this paper and the World Bank's Business Environment Survey results for India and China is attempted for understanding of regional and intra-regional policy factors for global competitiveness of SSIs. Subject to the comparability of economic structure, however, the analysis and results of this paper are of relevance and applicability for other developing countries in the world.

The rest of the paper is organised as follows. In [Section 1](#), a brief profile of the study area is given. In [Section 2](#), sources, characteristics and limitations of the databases are described. In [Section 3](#), infrastructure facilities and competitiveness are analysed. In [Section 4](#), the business environment and its impact on competitiveness are assessed. [Section 5](#) provides a comparison of this paper's results with the World Bank's Business Environment Survey results for India and China. In [Section 6](#), conclusions and policy implications are presented.

1. THE STUDY AREA

Karnataka State is one of the 29 States in India. For administrative purposes, the State is divided into 27 districts and 175 sub-district units. About 94 percent of total villages (=29483) are inhabited. Bangalore is the capital of the State.

Over the years, the State has earned a reputation for facilitating smooth, speedy and less costly transactions, liberalisation and simplifications of rules and regulations, transparency and accountability in public works and procurements, an explicit role for participation of the private sector in development of infrastructure, and in providing right to information for people. Thanks to the technological advances in information and communication technology, and Bangalore being the Silicon Valley of India, e-governance has become the hallmark of the State government.

Karnataka is richly endowed with infrastructure for human resources development. With 13 universities, 712 general education colleges, 97 medical colleges, 96 engineering colleges, 181 polytechnics, 300 industrial training centres, and several premier institutes/centres of research in science, management, information technology, fashion technology, legal education, manufacturing technology and foundry technology, the State is

aply called “the brain bank of India.” Availability of skilled manpower is one of the contributory factors for enormous growth of high-tech industries in the State, especially by multinational companies in the filed of information technology, electronics and communications, machine tools, engineering, automobiles, auto-components, food, agriculture, readymade garments, pharmaceuticals, agriculture and aero-space.

Karnataka’s position in India’s economic development is presented in [Table 1](#), [Table 2](#) and [Table 3](#) with select indicators of area and population, national income, industrial production, domestic and foreign investment, and export performance. In addition, select performance of indicators of SSIs is presented in [Table 4](#), as the focus of this paper is on SSIs.

Table 1: Select economic indicators of Karnataka State, 1991-2001

1	Indicators	Karnataka		India	
		1991	2001	1991	2001
	AREA AND POPULATION				
	GROWTH INDICATORS				
1.1	Percent in total area of the nation	5.84	5.84	100	100
1.2	Percent share in nation’s population	5.31	5.17	100	100
1.3	Share of rural population in total population	69.08	66.02	74.27	72.20
1.4	Average annual growth of total population: 1981-91 & 1991-2001	2.11	1.75	2.39	2.15
1.5	Crude birth rate: 1991 & 2000	26.8	22	29.5	25.8
1.6	Crude death rate	9	7.8	8.5	8.5
1.7	Infant mortality rate:	77	58	80	68
1.8	Ranking in Human Development Index (among 15 major states)	7	7	-	-

2	Indicators NATIONAL/STATE INCOME INDICATORS (at constant (1993-94) prices)	Karnataka		India	
		1994- 1995	2000- 2001	1994- 1995	2000- 2001
2.1	Annual growth of NSDP/NNP	5.23	10.31	7.1	4.2
2.2	Per capita NSDP/NNP (Rs.)	8097	11900	8069.9	10306
2.3	Annual growth of per capita income	3.0	9.05	4.9	2.4
	Share of NSDP/GDP by major sectors:				
2.4	Share of Primary sector (%)	36.3	32.2	33.0	26.0
2.5	Share of Secondary sector (%)	25.4	21.5	24.0	24.0
2.6	Share of Tertiary sector (%)	38.3	46.3	43.0	50.0
2.7	Average annual growth (%) of per capita NSDP/NNP during 1994-95 to 2000-01	-	6.22	-	6.32
3	INDUSTRIAL PRODUCTION INDICATORS (Base: 1993-94=100)	1994- 1995	2000- 2001	1994- 1995	2000- 2001
3.1	Annual growth (%) of total industrial production	9.48	3.51	8.4	5.0

Notes: (1) The annual exchange rate between Indian Rupee and US dollar is Rs.31.40 (or Rs.45.68) per dollar in 1994-95 (or 2000-01). (2) NSDP refers to net state domestic product; NNP refers to net national product; and GDP refers to gross domestic product.

Sources: (1) Economic Survey 2002-03, Government of India, New Delhi: 2003. (2) Economic Survey 2002-03, Planning Department, Government of Karnataka, Bangalore: 2003. (3) State Domestic Product Karnataka: 1993-94 to 2001-02, Directorate of Economics and Statistics, Government of Karnataka, Bangalore: 2003. (4) National Human Development Report 2001, Planning Commission, Government of India, New Delhi: 2002. (5) Report on Currency and Finance 2001-02, Reserve Bank of India, Mumbai: 2003.

Table 1 shows that Karnataka constitutes about 6 percent of total area and 5 percent of total population in the country. The share of rural population in the total population of the State and decadal growth rate of total population is lower than at the national level. In fact, the share of rural population in total population of the

State has declined from about 69 percent in 1991 to about 66 percent in 2001. Alternatively, the share of urban population in the State's total has reached 34 percent in 2001. In terms of lowering crude birth rate, death rate and infant mortality rate, Karnataka has a remarkable achievement as compared to national level, especially in 2001. Nevertheless, the State's ranking in Human Development Index has remained at 7 among the 15 major States.

Annual growth of State income (*i.e.*, net State Domestic Product at factor cost and constant prices) and per capita State income has increased from 1994-95 to 2000-01. In particular, the State's annual growth income is higher than at the national level in 2000-01. The level of the State's per capita income has remained higher than at the national level in 1994-94 and 2000-01. However, annual growth of per capita income in the State is higher than at the national level in 2000-01.

Distribution of State income across primary, secondary and tertiary sectors shows a major shift towards tertiary and secondary sectors, as at the national level. For instance, the secondary and tertiary sectors together contribute about 68 percent of total State income. This share is lower than at the national level (=74 percent).

Annual growth of industrial production (= percent changes in the value of index of industrial production) shows a decline from 9.48 percent in 1994-95 to 3.51 percent in 2000-01. The State's annual industrial growth is higher (or lower) than at the national level in 1994-95 (or 2000-01).

Table 2 presents indicators of total investment into Karnataka State for the quarter ending October 2002. The share of the State in the nation's total investment is about 8.61 percent. The distribution of total investment by sectors shows that service sector has received the highest investment (about 39 percent) and is followed by electricity and manufacturing sectors. Total

investment by ownership shows that private Indian investment is highest (about 51 percent) and is followed by the State Government and private Foreign investment (about 19 percent each).

Table 2: Select Investment Indicators of Karnataka State, October 2002

Indicators	October 2002
1. Total investment (Rs. in billion)	1309.79
2. Total investment in State as % to nation's total	8.61
3. Share of service sector in total investment (%)	38.51
4. Share of State Government's investment in total investment (%)	18.77
5. Share of Private Indian sector investment in total investment (%)	50.54
6. Share of Private Foreign sector's investment in total investment (%)	18.70

Note: The annual exchange rate between Indian Rupee and US dollar was Rs.47.69 per dollar in 2001-02.

Source: Monthly Review of Investment Projects, December 2002: Centre for Monitoring of Indian Economy, Mumbai: 2003.

Table 3 presents the export performance of the State in 2001-02. The annual growth of total exports is about 26 percent. Karnataka's share in nation's total exports is about 10 percent. The most important items, which contribute to State's export performance, are electronics and computer software (=57.25 percent), readymade garments (14 percent), engineering goods (5.2 percent) and silk products (3.34 percent).

Table 3: Select Export Performance Indicators of Karnataka State, 2001-02

Indicators	2001-02
1. Total value of exports (Rs. in million)	201,455.8
2. Annual growth of total exports (%)	25.69
3. Share of Karnataka's exports in nation's total (%)	9.70
4. Share of select items in Karnataka's total exports (%)	
4.1. Electronics & Computer Software	57.25
4.2. Readymade Garments	14.00
4.3. Engineering goods	5.20
4.4. Silk products	34

Note: The average annual exchange rate between Indian Rupee and US dollar was Rs.47.69 per dollar in 2001-02.

Source: Export Performance of Karnataka State, Visveswaraya Industrial and Trade Centre (VITC), Government of Karnataka, Bangalore: 2003: Processed

Table 4 highlights the status of SSIs in Karnataka in 2001-02.⁶ Total number of SSIs is equal to 0.29 million (or 8.42 percent of nation's total SSIs) with an annual growth of 6.30 percent. In the same way, annual growth of employment (or investment) in SSIs is 5 (or 9.07) percent. In fact, Karnataka has about 12.69 percent share in total employment of SSIs in the country. Thus, on the whole, Karnataka's performance has improved over the periods examined, and as compared to the all-India level.

⁶ No comparison at national level is attempted below, because data for corresponding performance indicators are not available at all-India level (*e.g.*, indicators of investment).

*Table 4: Status of Small-Scale Industries
in Karnataka State, 2001-02*

Indicators	Performance in 2001-02
1. Number of units	
1.1. Cumulative number of registered SSIs (million)	0.29
1.2. Annual growth in number of SSIs	6.30
1.3. Share in the nation's total (%)	8.42
2. Employment	
2.1. Cumulative total employment (million persons)	1.67
2.2. Annual growth of total employment	5.00
2.3. Share in nation's total (%)	12.69
3. Investment	
3.1. Cumulative total investment (Rs. in million)	5760
3.2. Annual growth of total investment	9.07

Note: The annual exchange rate between Indian Rupee and US dollar was Rs.33.45 (or Rs. 47.69) per US dollar in 1995-96 (or 2001-02).

Sources: Computed by the author, using the basic data in (a) Economic Survey 2003-04, Government of Karnataka, Bangalore: 2004; (b) Economic Survey 2003-04, Government of India, New Delhi: 2004; (c) Office of the Commissioner for Industrial Development, and Director, Department of Industries and Commerce, Government of Karnataka, Bangalore: and (d) Report on Currency and Finance 2001-02, Reserve Bank of India, Mumbai: 2003.

2. DATABASE

At the State level, the Department of Industries and Commerce is the most important source of data on SSIs. Available data in the Department are limited to annual (a) number of units by major industries, total investment and total employment at the time

of registration; and (b) export data by major 19 commodity-groups, which are not specific to SSIs but include SSIs.⁷ Data on production are not collected on regular basis, except in diagnostic and sample surveys, and census of SSIs (*e.g.*, [Government of India 2003a](#)).⁸ Thus, no index of industrial production for SSIs is constructed at the State level.⁹ In essence, available data are not helpful in assessment of quality and cost of infrastructure facilities, and business environment, by the SSIs (or demanders) in the State. Hence, it is essential to collect primary data for the purposes of this paper.

⁷ In addition, the data on SSIs are separately collected, organised and maintained by different regulatory and promotional (*e.g.*, marketing, financing and consultancy) institutions at the national and state level. These institutions include all India financial institutions (*e.g.*, Industrial Development Bank of India); public and private sector commercial banks; Small Industries Development Bank of India; State level financial institutions (*e.g.* Karnataka State Financial Corporation and Karnataka State Industrial Investment and Development Corporation (KSIIDC)); State level promotional organisations (*e.g.*, Karnataka Council for Technological Upgradation, Karnataka Industrial Area Development Board (KIADB), and Karnataka State Small Industries Development Corporation). Further, industry associations (*e.g.*, Karnataka Small Scale Industries Association) have information on their SSI-members. These data not consolidated, and integrated with the data in the Department of Industries and Commerce.

⁸ At the national level, estimates of production of SSIs are prepared by the Office of the DC(SSI) and are reported in the annual pre-budget Economic Survey of the Government of India (see, for instance, [Government of India 2003b](#)). Lack of data on production of SSIs at the State level is evident, for instance, in the Economic Survey of Government of Karnataka ([Government of Karnataka 2003](#)).

⁹ At the national level, the Office of the DC(SSI), Government of India, has been undertaking the computation of an Index of Industrial Production for small scale sector (since 1976) with base year 1970. Surprisingly, the Index at the national level is not published, as it is meant for “internal use” only.

Primary data were collected from a simple random sample survey of 373 manufacturing SSIs in the State.¹⁰ Sample units were selected from different sectors comprising engineering, electronics, electrical, handicrafts, chemicals, drugs and pharmaceuticals, food products, plastics, textiles and garments, tiles, leather and others industries. In the same way, sample units were drawn from different districts. Further, to account for inter-regional disparities, the sample units are classified under three regions: Bangalore Urban region, Northern and Coastal region, and Southern region.

The distribution of sample units by industries and regions is presented in Table 5.¹¹ Engineering industries dominate the total number of sample units in all the regions: 47.83 percent in Bangalore Urban region, 24.76 percent in Northern and Coastal region and 23.08 percent in Southern region. About 83 percent of sample units in Bangalore urban region, 86 percent in Northern and Coastal region and 82 percent in Southern region are concentrated in seven major industries. However, within each industry, sample units vary between regions: Bangalore Urban region in engineering and electronics industries; Northern and Coastal region in chemicals and pharmaceutical, plastics and food product industries; Southern region in electrical, handicraft and other industries. Thus, the sample units represent spatial and industrial diversity of SSIs, and offer factual bases for inter-regional analysis of competitiveness of SSIs.

¹⁰ All information in the sample survey was collected through a detailed structured questionnaire. The questionnaire was canvassed through direct and personal interview method. The proprietor or his or her authorised person was the respondent of the questionnaire. A copy of the questionnaire is available from the author upon request.

¹¹ The list of products manufactured by the sample SSIs by major industries is available upon request from the author.

Table 5: Distribution of Sample Units by Industries and Regions

Industries	Number of sample units			
	Bangalore Urban region	Northern & Coastal region	Southern region	All regions
1. Engineering	66 [54.10] (47.83)	26 [21.31] (24.76)	30 [24.59] (23.08)	122 [100.00] (32.71)
2. Electronics	13 [68.42] (9.42)	4 [21.05] (3.81)	2 [10.53] (1.54)	19 [100.00] (5.09)
3. Electrical	9 [25.71] (6.52)	11 [31.43] (10.48)	15 [42.86] (11.54)	35 [100.00] (9.38)
4. Handicraft	5 [15.15] (3.62)	0 [0.00] (0.00)	28 [84.85] (21.54)	33 [100.00] (8.85)
5. Chemical, Drug & Pharmaceuticals	9 [32.14] (6.52)	10 [35.71] (9.52)	9 [32.14] (6.92)	28 [100.00] (7.51)
6. Plastics	11 [21.15] (7.97)	25 [48.08] (23.81)	16 [30.77] (12.31)	52 [100.00] (13.94)
7. Food Products	[9.09] (1.45)	14 [63.64] (13.33)	6 [27.27] (4.62)	22 [100.00] (5.90)
Sub-total (1-7)	115 [36.98] (83.33)	90 [28.94] (85.71)	106 [34.08] (81.54)	311 [100.00] (83.38)
8. Others	23 [37.10] (16.67)	15 [24.19] (14.29)	24 [38.71] (18.46)	62 [100.00] (16.62)
Total	138 [37.00] (100.00)	105 [28.15] (100.00)	130 [34.85] (100.00)	373 [100.00] (100.00)

Notes: (a) Figures in square brackets are percent to row's total. (b) Figures in parentheses are percent to column's total. (c) Bangalore Urban region includes sample units from Bangalore Urban district. Northern and Coastal region include sample units from Dharwad, Hubli, and Mangalore. Southern region includes sample units from Chitradurga, Channapatna, Hoskote, Kolar, Mysore and Tumkur. (d) Others include textiles and garments.

Source: Compiled from the Random Sample Survey of 373 SSIs in Karnataka State during October-December, 2002 for the study in [Narayana \(2003a\)](#).

3. INFRASTRUCTURE FACILITIES AND COMPETITIVENESS

3.1. Transport facilities

Quality and cost of available transport facilities and its impact on competitiveness are presented in Table 6. Quality is reflected by goodness of road conditions and availability of containers (*i.e.*, for damage-proof packing) for transport or shipping of goods to marketing places.

Table 6: Transport facilities and competitiveness

Indicators	Bangalore Urban region	Northern & Coastal region	Southern region	Total
Number of sample units	138	105	130	373
1. Road conditions for transport/shipping of goods to marketing places				
1.1. Very good	2 (1.40)	1 (0.90)	0 (0.00)	3 (0.80)
1.2. Good	31 (22.4)	48 (45.7)	37 (28.40)	116 (31)
1.3. Not bad/satisfactory	86 (62.30)	53 (50.40)	89 (68.40)	228 (61.10)
1.4. Bad	19 (13.70)	2 (1.90)	3 (2.30)	24 (6.40)
2. Availability of containers for transport/shipping of goods is adequate	89 (64.40)	82 (78.00)	91 (70.00)	262 (70.20)
3. Transport facilities affect competitiveness in domestic and world markets due to:				
3.1. High cost	38 (27.50)	54 (51.40)	46 (35.30)	138 (36.90)
3.2. Poor road conditions	33 (23.90)	32 (30.40)	28 (21.50)	93 (24.90)
3.3. Inadequate containers	17 (12.30)	10 (9.50)	23 (17.60)	50 (13.40)

Note: Figures in parentheses are per cent to total number of sample units in each region or in all regions.

Source: Same as in Table 5.

Road conditions for transport of goods to marketing places are considered good by about 23.8 percent of sample SSI units (or,

in brief, units) in Bangalore Urban region, 46.6 percent of units in Northern and Coastal region, 28.4 percent of units in Southern region and 31.8 percent of units in the entire State. Availability of containers for transport of goods is considered highly adequate in all the regions: about 64 percent of units in Bangalore Urban region, 78 percent of units in Northern and Coastal region, 70 percent of units in Southern region and 70 percent of units in the entire State.

The combined impact of high cost, poor road conditions and inadequate containers has differential regional impact on competitiveness of units: about 36 percent in Bangalore Urban region, 61 percent in Northern and Coastal region, 39 percent in Southern region and 44 percent in the entire State. In particular, high cost of transportation is considered the most important factor that affects competitiveness by about 28 percent of units in Bangalore Urban region, 51 percent of units in Northern and Coastal region, 35 percent of units in Southern region and 37 percent of units in the entire State. Thus, the competitiveness of SSIs in Northern and Coastal is relatively more affected by high cost and other inadequacies of transport facility than the SSIs located in other regions in the State.

3.2. Market information

In a globalising economy, information on competitive products and prices is vital for designing production and marketing strategies by SSIs. Provision of market information, sources of market information and impact of lack of market information on competitiveness of SSIs are presented in [Table 7](#).

Table 7: Market Information and Competitiveness

Indicators	Bangalore Urban region	Northern & Coastal region	Southern region	Total
Number of sample units	138	105	130	373
1. Provided with market information on:	101 (73.1)	94 (89.5)	101 (77.6)	296 (79.3)
1.1. Domestic market price	80 (57.9)	44 (41.9)	34 (26.1)	158 (42.3)
1.2. Nature of competition	24 (17.3)	37 (35.2)	29 (22.3)	90 (24.1)
1.3. Demand conditions	49 (35.5)	51 (48.5)	57 (43.8)	157 (42)
1.4. Marketing strategy (<i>i.e.</i> , advertisements through mass media)	58 (42)	55 (52.3)	37 (28.6)	150 (40.2)
1.5. Tariff barriers	8 (5.7)	6 (5.7)	5 (3.8)	19 (5)
1.6. Non-tariff barriers	8 (5.7)	1 (0.9)	4 (3)	13 (3.4)
1.7. Compliance with WTO agreements	3 (2.1)	4 (3.8)	4 (3)	11 (2.9)
1.8. Nature & number of competitors	14 (10.1)	10 (9.5)	13 (10)	37 (9.9)
1.9 Others	0 (0)	0 (0)	1 (0.7)	1 (0.2)
2. Source of market information:				
2.1. Industrial association	51 (36.9)	72 (68.5)	23 (17.6)	146 (39.1)
2.2. Newspaper	63 (45.6)	13 (12.3)	80 (61.5)	156 (41.8)
2.3. Radio	7 (5)	11 (10.4)	12 (9.2)	30 (8)
2.4. Television	12 (8.6)	6 (5.7)	10 (7.6)	28 (7.5)
2.5. Export promotion councils	12 (8.6)	8 (7.6)	6 (4.6)	26 (6.9)
2.6. Others	11 (7.9)	14 (13.3)	13 (10)	38 (10.1)
3. Poor marketing facilities affect competitiveness in domestic and world markets	41 (29.7)	76 (72.3)	22 (16.9)	169 (45.3)

Note and source: Same as in Table 6.

SSIs are provided with information on demand conditions, marketing strategy, market price and nature of competition. For instance, market information on demand conditions (or market

prices) is provided for about 36 (or 58) percent of units in Bangalore Urban region, 49 (or 42) percent of units in Northern and Coastal region, 44 (or 26) percent of units in Southern region and 24 (or 42) percent of units in the entire State. Of the sources of market information, industry associations and newspapers are most important for sample SSIs. For instance, industry associations (or newspapers) are the sources of market information for about 37 (or 46) percent of units in Bangalore Urban region, 69 (or 12) percent of units in Northern and Coastal region, 18 (or 62) percent of units in Southern region and 39 (or 42) percent of units in the entire State. Poor market information affects competitiveness in about 30 percent of units in Bangalore Urban region, 72 percent of units in Northern and Coastal region, 17 percent of units in Southern region and 45 percent of units in the entire State. Thus, competitiveness of SSIs in Northern and Coastal region is affected more due to lack of market information than SSIs in other regions in the State.

Market information that is relevant for the WTO regime, such as tariff barriers, non-tariff barriers and compliance with WTO, is provided least for the SSIs. To gain further insight into this aspect of market information, nature and extent of awareness of WTO agreements are identified, as given in [Table 8](#). This reveals the following insights.

First, awareness of WTO is widely spread among the SSIs, with considerable inter-regional variations. About 71.3 percent of units in Bangalore Urban region, 75 percent of units in Northern and Coastal region, 82 percent of units in Southern region and 73 percent of units in the entire State are aware of WTO as an international trading arrangement.¹²

¹² Awareness of WTO is judged by asking the respondents to name different agreements and by probing their awareness of the nature and impact of different agreements.

Table 8: Awareness and Impact of WTO Agreements

Awareness indicators	Bangalore Urban region	Northern & Coastal region	Southern region	Total
Number of sample units	138	105	130	373
1. Aware of WTO	99 (71.3)	79 (75.2)	107 (82.3)	285 (73.4)
2. Aware that removal of quantitative restrictions is due to WTO	62 (44.9)	34 (32.1)	35 (25.3)	131 (35.1)
3. Faced non-tariff barriers in export markets	26 (18.8)	11 (10.5)	15 (10.8)	52 (13.9)
4. Faced sanitary and phytosanitary barriers in export markets	33 (23.9)	8 (7.6)	19 (13.7)	60 (16)
5. Hurt by the problem of dumping	73 (52.8)	36 (34.3)	60 (46.1)	169 (45.3)
6. Faced pre-shipment inspection in exports	57 (41.3)	15 (14.3)	28 (21.5)	100 (26.8)
7. Social auditing have been done before the export orders are placed	34 (24.6)	10 (9.5)	22 (16.9)	66 (17.6)
8. Faced any technical barriers to trade	27 (19.5)	5 (4.8)	11 (8.4)	43 (11.5)

Note and source: Same as in Table 6.

Second, of the problems faced because of WTO agreements, dumping is considered the most hurtful by about 53 percent of units in Bangalore Urban region, 34 percent of units in Northern and Coastal region, 46 percent of units in Southern region and 45 percent in the entire State. This evidence needs a strong qualification, because the definition of dumping is widely misunderstood for availability of cheap imported goods. Nevertheless, the result indicates that SSIs are aware of import (price) competition for their products in the domestic market.

Third, of all the WTO agreements, the least impact is felt from technical barriers to trade by about 20 percent of units in

Bangalore Urban region, 5 percent of units in Northern and Coastal region, 8 percent of units in Southern region and 11 percent in the entire State.

3.3. Credit facilities

Table 9 presents indicators of credit facilities, *viz.*, nature of borrowings, sources of borrowings and sources of poor credit facilities, which affect competitiveness of SSIs.

Borrowings for working capital requirements dominate over borrowings for fixed capital requirements. For instance, about 33 percent of units in Bangalore Urban region, 34 percent of units in Northern and Coastal region, 37 percent of units in Southern region and 35 percent of units in the entire State have borrowed for working capital requirements.

Major requirements for fixed capital borrowings (in terms of percent of total borrowings for fixed capital requirements) are for purchase of plant and machinery, and purchase of land and buildings. However, in terms of inter-regional distribution of borrowings, Bangalore Urban region exhibits heavy concentration of borrowings: about 79 percent of total borrowings in the State for investment on plant and machinery, and 97 percent for purchase of land and buildings.

Purchase of raw materials accounts for the entire working capital borrowings for sample SSIs. Of the sources of borrowings, development banks in Northern and Coastal region, commercial banks in Southern region and private sources in Bangalore Urban region dominate over other sources of credit supply for SSIs.

Poor credit facilities affect competitiveness in about 65 percent of units in Bangalore Urban region, 91 percent of units in Northern and Coastal region, 94 percent of units in Southern region and 82 percent of units in the entire State. The important

Table 9: Credit Facilities and Competitiveness

Indicators	Bangalore	Northern &		Total
	Urban region	Coastal region	Southern region	
Number of sample units	138	105	130	373
1. Borrowed for fixed capital requirements	38 (27.5)	35 (33.3)	12 (9.2)	85 (22.7)
2. Percent distribution of borrowing for fixed capital purposes in the State				
2.1. Investment in plant and machinery	79.3	9.9	10.8	100
2.2. Purchase of land and building	96.9	0	3.1	100
3. Borrowed for working capital requirements	45 (32.6)	36 (34.3)	48 (36.9)	129 (34.5)
4. Percent of working capital borrowings for purchase of raw materials	100	100	100	100
5. Major sources of borrowing for working capital purposes				
5.1. Commercial banks	141 (23.4)	152 (28.5)	200 (63.7)	493 (34.0)
5.2. Development banks (e.g., Karnataka State Financial Corporation)	229 (38.0)	377 (70.7)	114 (36.3)	720 (49.6)
5.3. Private sources	233 (38.7)	4 (0.8)	0 (0)	237 (16.4)
6. Poor credit facilities affect competitiveness in domestic and world market in terms of:				
6.1. Inadequate supply of finance	60 (43.4)	35 (33.3)	36 (27.6)	131 (35.1)
6.2. High interest rate	71 (51.4)	86 (81.9)	110 (84.6)	267 (71.5)
6.3. Untimely credit	22 (15.9)	20 (19)	21 (16.1)	63 (16.8)
6.4. High transaction costs ¹³	17 (12.3)	18 (17.14)	54 (41.5)	89 (23.8)
6.5. Low repayment period	19 (13.7)	14 (13.3)	12 (9.2)	45 (12)

Note and source: Same as in Table 6.

¹³ I.e., application fee, bank credit not released in time, low repayment period, number of visits to banks, etc.

cause of poor credit facilities is attributed to high interest rates by about 51 percent of units in Bangalore Urban region, 82 percent of units in Northern and Coastal region, 85 percent of units in Southern region and 72 percent of units in the entire State. In addition, about 43 percent of units in Bangalore Urban region, 33 percent of units in Northern and Coastal region, 28 percent of units in Southern region and 35 percent of units in the entire State consider that inadequate supply of finance is an important factor for poor credit facilities.

Poor credit facilities affect the competitiveness of SSIs in different regions by different components. For instance, competitiveness is more affected by high interest rates (or high transaction costs) in Southern region (or Northern and Coastal region) and by inadequate finance in Bangalore Urban region.

3.4. Power supply

The importance of power supply is captured by sources of power supply, reasons for lack of continuous power supply and impact of poor quality and high cost of power supply on competitiveness. The results, as summarised in [Table 10](#), imply the following:

- Electricity is the most important source of energy for about 98 percent of units in Bangalore Urban region, 98 percent of units in Northern and Coastal region, 92 percent of units in Southern region and 93 percent of units in the entire State.
- Official power cuts and voltage fluctuations are the most important reasons for lack of continuous power supply. For instance, official power cuts are a major problem in about 46 percent of units in Bangalore Urban region, 74 percent of units in Northern and Coastal region, 79 percent of units in Southern region and 65 percent of units in the entire State.

- Periodic hikes in electricity tariffs are the major reason for high cost of electricity for about 51 percent of units in Bangalore Urban region, 91 percent of units in Northern and Coastal region, 96 percent of units in Southern region and 78 percent of units in the entire State.

Table 10: Power Supply and Competitiveness

Indicators	Bangalore	Northern &		Total
	Urban region	Coastal region	Southern region	
Number of sample units	138	105	130	373
1. Major source of power used:				
1.1. Electricity	135 (97.8)	103 (98)	129 (92.3)	367 (98.3)
1.2. Diesel	1 (0.7)	0 (0)	0 (0)	1 (0.2)
1.3. Solar	0 (0)	0 (0)	0 (0)	0 (0)
1.4. Others	0 (0)	1 (0.9)	0 (0)	1 (0.2)
2. Reasons for lack of continuous power supply	96 (69.5)	99 (94.2)	120 (92.3)	315 (84.4)
2.1. Voltage fluctuations	57(41.3)	82 (78)	82 (63)	221 (59.2)
2.2. Official power cuts	63 (45.6)	78 (74.2)	103 (79.2)	244 (65.4)
2.3. No power due to natural calamity	20 (14.4)	15 (14.2)	29 (22.3)	64 (17.1)
2.4. Lack of in-time fault repairs	18 (13)	14 (13.3)	23 (17.6)	55 (14.7)
2.5. Others	0 (0)	0 (0)	0 (0)	0 (0)
3. Cost of power is considered high due to:				
3.1. Periodic rise in tariff	71 (51.4)	96 (91.4)	125 (96.1)	292 (78.2)
3.2. Lack of continuous supply of electricity	33 (23.9)	32 (30.4)	51 (39.2)	116 (31.1)
3.3. Transmission and distribution losses	21 (15.2)	18 (17.1)	24 (18.4)	63 (16.8)
3.4. Others	0 (0)	0 (0)	2 (1.5)	2 (0.5)
4. Poor quality and high cost of power affect competitiveness in domestic and world markets	77 (55.7)	98 (93.3)	116 (89.2)	291 (78)

Note and source: Same as in Table 6.

- High cost and low quality of power supply affect competitiveness of about 56 percent of units in Bangalore Urban region, 93 percent of units in Northern and Coastal

region, 89 percent of units in Southern region and 78 percent of units in the entire State. Thus, the competitiveness of SSIs in Northern and Coastal regions are more affected by high cost and low quality of power supply than SSIs.

3.5. Water supply

The importance of water supply is captured by sources of water supply, major problems of water supply and impact of poor quality and high cost of water supply on competitiveness. The results are summarised in [Table 11](#).

The most important source of water differs between regions. That is, own sources in Bangalore Urban region (42 percent), city corporation in Northern and Coastal region (55 percent), own sources in Southern region (36 percent) and own sources in the entire State (42 percent). Other sources of water supply include Bangalore Water Supply and Sewerage Board (BWSSB) for units in Bangalore Urban region, own and other sources for SSIs in the rest of the regions and in the entire State.

Irregularity in official water supply is a major problem of water supply for about 17 percent of units in Bangalore Urban region, 52 percent of units in Northern and Coastal region, 23 percent of units in Southern region and 29 percent of units in the entire State.

Periodic hikes in water charges are the major reason for high cost of water for about 18 percent of units in Bangalore Urban region, 37 percent of units in Northern and Coastal region, 12 percent of units in Southern region and 21 percent of units in the entire State. In addition, irregularity of water supply due to electricity problems is reported by about 6 percent of units in Bangalore Urban region, 30 percent of units in Northern and Coastal region, 38 percent of units in Southern region and 24 percent of units in the entire State.

Table 11: Water Supply and Competitiveness

Indicators	Bangalore Urban region	Northern & Coastal region	Southern region	Total
Number of sample units	138	105	130	373
1. Major source of water used:				
1.1. Karnataka Urban Water Supply and Sewerage Board	1 (0.7)	0 (0)	5 (3.8)	6 (1.6)
1.2. Bangalore Water Supply and Sewerage Board	43 (31.1)	0 (0)	0 (0)	43 (11.5)
1.3. Municipality	8 (5.7)	1 (0.9)	1 (0.7)	10 (2.6)
1.4. City Corporation	4 (2.8)	58 (55.2)	42 (32.3)	104 (27.8)
1.5. Own sources (open/bore wells)	58 (42)	54 (51.4)	47 (36.1)	159 (42.6)
1.6. Other source	50 (36.2)	25 (23.8)	30 (23)	105 (28.1)
2. Major problems in official supply of water:				
2.1. Non-supply everyday	23 (16.6)	55 (52.3)	30 (23)	108 (28.9)
2.2. Poor quality	7 (5)	21 (20)	1 (0.7)	29 (7.7)
2.3. Lack of in-time fault repairs	10 (7.2)	14 (13.3)	13 (10)	37 (9.9)
2.4. Others	4 (2.8)	0 (0)	22 (16.9)	26 (6.9)
3. Cost of water from official sources is high due to:				
3.1. Periodic rise in water charges	25 (18.1)	39 (37.1)	15 (11.5)	79 (21.1)
3.2. Irregular supply caused by electricity problems	8 (5.7)	32 (30.4)	51 (38.4)	91 (24.3)
3.3. Others	1 (0.7)	5 (4.7)	4 (3)	10 (2.6)
4. Poor quality and high cost of water facilities are affecting your competitiveness in domestic and world markets	29 (21)	62 (59)	41 (31.5)	132 (35.3)

Note and source: Same as in Table 6.

High cost and low quality of water supply affect competitiveness of about 21 percent of units in Bangalore Urban region, 59 percent of units in Northern and Coastal region, 32 percent of units in Southern region and 35 percent of units in the entire State. In other words, the competitiveness of SSIs in Northern and Coastal regions is more affected by high cost and low quality of water supply than that of SSIs in other regions.

3.6. Telecom services

Telecommunication services are essential to marketing of products within and outside the country. Access and affordability are important criteria for utilisation of telecom services. These indicators of telecom services are presented in [Table 12](#).

Subscription to telephone connections is widespread. For instance, about 99 percent of units in Bangalore Urban region, 97 percent of units in Northern and Coastal region, 96 percent of units in Southern region and 97 percent of units in the entire State have direct telephone connections. Subscription to basic telephone services is also widespread. For instance, the number of units with subscription to STD (or Subscriber Trunk Dialling) and ISD (or International Subscriber Dialling) connection is about 79 percent in Bangalore Urban region, 95 percent in Northern and Coastal region, 80 percent in Southern region and 84 percent in the entire State.

Subscription to phone-plus and value added services varies between regions. For instance, subscription to phone-plus services is about 46 percent in Bangalore Urban region, 19 percent in Northern and Coastal region, 12 percent in Southern region and 27 percent in the entire State. Of the value added services, subscription to Internet services, ISDN (or Integrated Services Digital Network) and cellular services is most prominent among sample SSIs.

Subscription to mobile telephone is remarkable. About 67 percent of units in Bangalore Urban region, 54 percent of units in Northern and Coastal region, 69 percent of units in Southern region and 64 percent of units in the entire State have mobile telephones.

Table 12: Telecom Services and Competitiveness

Indicators	Bangalore	Northern &		Total
	Urban region	Coastal region	Southern region	
Number of sample units	138	105	130	373
1. Have a fixed telephone connection	136 (98.5)	102 (97.1)	125 (96.1)	363 (97.3)
2. Have STD and ISD facilities on own telephone/s	109 (78.9)	100 (95.2)	104 (80.0)	313 (83.9)
3. Subscriber of phone-plus-services by:				
4. Subscriber of value added services	64 (46.3)	20 (19.0)	15 (11.5)	99 (26.5)
4.1. Subscriber of Internet services	62 (44.9)	32 (30.4)	22 (16.9)	116 (31.0)
4.2. Subscriber of Integrated Services Digital Network	59 (42.7)	31 (29.5)	20 (15.3)	110 (29.4)
4.3. Subscriber of Intelligent Network	16 (11.5)	9 (8.5)	6 (4.6)	31 (8.3)
5. Subscriber of a mobile telephone service	7 (5.5)	4 (3.8)	4 (3.0)	15 (4.0)
6. Telecom services are affecting your competitiveness in domestic and world markets, because of:	92 (66.6)	57 (54.2)	90 (69.2)	239 (64.0)
6.1. High tariff on local calls	33 (23.9)	43 (40.9)	13 (10.0)	89 (23.8)
6.2. High tariff on STD calls	7 (5.5)	16 (15.2)	2 (1.5)	25 (6.7)
6.3. High tariff on ISD calls	14 (10.1)	26 (24.7)	6 (4.6)	46 (12.3)
6.4. High rental charges	11 (7.9)	9 (8.5)	7 (5.3)	27 (7.2)
	2 (1.4)	4 (3.8)	1 (0.8)	7 (1.8)

Note and source: Same as in Table 6.

High cost (*i.e.*, high tariff on local and STD calls) of basic telecom services is an important factor which affects the competitiveness. In particular, the competitiveness of SSIs in Northern and Coastal region is more affected by all components of high cost of basic telecom services than is that of the SSIs in other regions in the State.¹⁴

¹⁴ Improvement in telecom services and usage contributes to global competitiveness of SSIs in regard to information and communication technology indicators. This is evident, for instance, in the World Economic Forum's

3.7. Technology upgradation

Evidence for awareness of type and cost of technology upgradation, sources of information on technology upgradation, choice between indigenous and imported technology and impact of technology upgradation on competitiveness of SSIs are presented in [Table 13](#). The evidence implies the following:

- Awareness of type and cost of technology upgradation required for production purposes varies between regions. For instance, about 53 (or 46) percent of units in Bangalore Urban region, 91 (or 79) percent of units in Northern and Coastal region, 45 (or 37) percent of units in Southern region and 74 (or 52) percent of units in the entire State are aware of their technology upgradation requirements (or cost).
- The most important sources of information on technology upgradation are business partners/friends/relatives, industry associations, newspapers and television. For instance, about 25 percent of units in Bangalore Urban region, 37 percent of units in Northern and Coastal region, 20 percent of units in Southern region and 27 percent of units in the entire State have sourced technology upgradation from their business partners.
- Imported technology is preferred to indigenous technology by about 36 percent of units in Bangalore Urban region, 48 percent of units in Northern and Coastal region, 28 percent of units in Southern region and 36 percent of units in the entire State.

Networked Readiness Indicator and International Telecommunication Union's Digital Access Index. The variables and methodology in construction of these indicators are available on the following websites: www.weforum.org/gitr and <http://www.itu.int/ITU-D/ict/dai/index.html>.

Table 13: Technology Upgradation and Competitiveness

Indicators	Bangalore	Northern		
	Urban region	& Coastal region	Southern region	Total
Number of sample units	138	105	130	373
1. Aware of the type of technology upgradation required for production	73 (52.8)	96 (91.4)	58 (44.6)	227 (74.2)
2. Aware of the cost of technology up-gradation required production	64 (46.3)	83 (79)	48 (36.9)	195 (52.2)
3. Source of information on the type and cost of technology up-gradation:				
3.1. Industry associations	44 (31.8)	41 (39)	10 (7.6)	91 (24.3)
3.2. Karnataka Council for Technological Upgradation	7 (5)	3 (2.8)	5 (3.8)	15 (4)
3.3. Newspaper	23 (16.6)	27 (25.7)	16 (12.3)	66 (17.6)
3.4. Television	20 (14.4)	10 (9.5)	2 (1.5)	32 (8.5)
3.5. Radio	9 (6.5)	15 (14.2)	0 (0)	24 (6.4)
3.6. Vendors	1 (0.72)	5 (4.7)	0 (0)	6 (1.6)
3.7. Exporters	18 (13)	2 (1.9)	0 (0)	20 (5.3)
3.8. Business partners/ friends/relatives	35 (25.3)	39 (37.1)	26 (20.0)	100 (26.8)
3.9. Others	2 (1.4)	1 (0.9)	0 (0)	3 (0.8)
4. Prefer indigenous to imported technology	49 (35.5)	50 (47.6)	36 (27.6)	135 (36)
5. Advantages of imported technology over indigenous technology				
5.1. Less cost	19 (13.7)	24 (22.8)	8 (6.1)	57 (15.2)
5.2. More durable	31(22.4)	15 (14.2)	7 (53.8)	53 (14.2)
5.3. More productive	34 (24.6)	43(40.9)	30 (23)	107 (28.6)
5.4. More capital intensive	32 (23.1)	24 (22.8)	12 (9.2)	68 (18.2)
5.5. Others	1 (0.72)	0 (0)	0 (0)	1 (0.2)
6. Present low technology affects competitiveness in domestic and world markets	94 (68.1)	96 (91.4)	123 (94.6)	313 (83.9)

Note and source: Same as in Table 6.

- The most important advantages of imported technology are related to higher productivity, durability, capital intensity and lower cost. For instance, about 25 percent of units in Bangalore Urban region, 41 percent of units in Northern and Coastal region, 23 percent of units in Southern region and 29 percent of units in the entire State prefer imported technology due to higher productivity over indigenous technology.
- Low technology affects competitiveness in about 68 percent of units in Bangalore Urban region, 91 percent of units in Northern and Coastal region, 95 percent of units in Southern region and 84 percent of units in the entire State.¹⁵ Thus, SSIs in Northern and Coastal region are more affected by low technology than SSIs in other regions in the State.

¹⁵ Innovation is an important aspect in the study of technology, which affects competitiveness. In a recent sample study of 34 SSI engineering firms in Bangalore Urban district, [Bala Subrahmanya \(2003\)](#) has captured, among others, the nature, sources and dimensions of technological innovation. The study distinguishes innovations by radical and incremental innovations:

“‘Radical’ innovations refer to new products that result from advances in knowledge/technology. ‘Incremental’ innovations refer to the improvement of the process or product designs, with or without upgradation of machinery/acquisition of new machinery.’”

The study finds that changed product designs (driven by customer needs) are the most important dimension of technological innovation undertaken by sample SSIs. This is followed by new product development, driven by self-motivation. The most important sources of innovations is large customers. However, internal Research and Development (R&D) is attributed as a source of innovation by about 26 percent of sample SSIs. Thus, “for entrepreneurs, who have innovated new products with self-motivation and self-efforts, innovation is basically a ‘growth strategy.’” Whereas for entrepreneurs, who have improved existing products, due to either their own initiative and efforts or customers pressures/direction and support, innovation is primarily a ‘survival strategy.’” As new product development of SSIs is solely due to internal factors (*e.g.*, self-motivation and internal R&D), “there is little that policy makers could do to improve radical innovations—at the enterprise level.”

3.8. Quality certification

An important objective of technology upgradation is quality improvement. A well-known certification for quality is ISO (or International Organization for Standardization) certification. An analysis of coverage of the SSIs by major industries and their location in the State shall help in understanding the nature and extent of quality improvement undertaken by the SSIs. However, the sample survey of SSIs for this paper (as elaborated in [Section 2](#)) did not get positive responses to acquiring ISO certification by SSIs. Consequently, the following secondary data analysis is undertaken and is relevant for the SSIs in the State as a whole.

3.8.1. Coverage of ISO certification

To ascertain the coverage of SSIs under the quality improvement measure, lists of ISO-certified SSIs were obtained from two sources, viz., Karnataka Council for Technological Upgradation and Ministry of Small Scale Industry and Agro and Rural Industries. The basic data are classified according to the major industries and locations (whether in Bangalore Urban district or not).

3.8.1.1. Ministry of Small Scale Industries (SSI) and Agro and Rural Industries (ARI)

The Ministry of SSI and ARI of the Government of India has introduced a one-time financial incentive scheme in 1994 for encouraging SSIs to acquire ISO-9000 (or its equivalent) certification. Under this scheme, 75 percent of charges for acquiring certification is reimbursed to the SSIs, subject to a maximum amount of Rs.75000 for each eligible SSI. From March 1994 to March 2002, about 2376 SSIs received this financial incentive in the country. These ISO certified SSIs constitute 0.08

percent of total number of registered SSIs in the country in 2002-03 (=2.849 million).

Coverage of the ISO certified SSIs by major products is as follows: electrical and electronics and information technology, 24 percent; mechanical and metallurgical products, 51 percent; chemicals, drugs and pharmaceutical products, 11 percent; glass and ceramics industries, 1.64 percent; plastic and rubber products, plus moulded parts, 8.63 percent; food and allied industries, 0.97 percent; textile products, including hosiery, 1.78 percent; and leather and footwear, 0.80 percent. Thus, about 86 percent of SSIs in the country belongs to three major industries: electrical and electronics and information technology; mechanical and metallurgical products; and chemicals, drugs and pharmaceutical products.

Of total 2376 beneficiary SSIs in the country, 138 (about 5.8 percent) of SSIs belong to Karnataka State. Within the State, the coverage and location of industries are as given in [Table 14](#).

As in the case of all-India data, scope of industries covered by the incentive scheme is heavily concentrated in engineering goods industries (56 percent). This is followed by the concentration of ISO certified SSIs in electrical, electronics and information technology industries (25 percent) and chemicals, drugs and pharmaceuticals (7.2 percent). Thus, the combined share of these industries is about 88.2 percent. Further, the location pattern of ISO certified SSIs shows that about 83 percent of the SSIs are located in Bangalore Urban district.

*Table 14: Coverage of SSIs under ISO Certification
by Major Industries in Karnataka
(based on Ministry of SSI and ARI data)*

Industries	Number of SSIs	Number of units	
		Bangalore Urban district	All other districts
1. Engineering	77	62	15
2. Electrical and electronics, information technology or both	35	29	6
3. Textiles	2	2	0
4. Chemicals, drug and pharmaceuticals	10	9	1
5. Plastics	8	7	1
6. Others	6	6	0
Total	138	115	23

Notes: Others include manufacturers of Solar systems, Glass & Ceramics, Leather, Flanges & burls, Abrasive products and Design products.

Source: Compiled and computed from the basic data on:

www.ssi.nic.in/isostate.htm.

3.8.1.2. Government of Karnataka

The Karnataka Council for Technological Upgradation (KCTU) of the Government of Karnataka has maintained a list of ISO certified SSIs, which are the beneficiaries of State Government's incentives for acquiring ISO certification. In total, the lists contain 180 SSIs. A check to ascertain whether these SSIs are the same as under the Union Ministry of SSI and ARI confirms that the KCTU list is the unduplicated list of SSIs. Hence, the lists of ISO certified SSIs in the Union Ministry of SSI and ARI and KCTU are pooled. The pooled SSIs (=310) constitute 0.10 percent of total registered SSIs in the State (=0.298 million) in 2002-03.

Table 15: Coverage of SSIs Under ISO Certification by Major Industries in Karnataka (based on Karnataka Council for Technological Upgradation data)

Industries	Number of SSIs	Number of units	
		Bangalore Urban district	All other districts
1. Engineering	80	65	15
2. Electrical, electronics or both	41	37	4
3. Textiles	3	1	2
4. Chemicals, drugs and pharmaceuticals	10	9	1
5. Plastics	10	8	2
6. Computer software	10	10	0
7. Others	10	6	4
8. Unclassified	16	13	3
TOTAL	180	149	31

Notes: Unclassified industries include Tiles, Stationary items, Solar systems, Medical equipment, Optical, Cables, Food products and Package materials.

Source: Compiled and computed from basic data on the records of the Karnataka Council for Technological Upgradation, Government of Karnataka, Bangalore.

Table 15 presents the ISO certified SSIs by industries and location in the State. The scope of industries covered by the incentive scheme is heavily concentrated in engineering goods industries (44 percent), and electrical and electronic industries (23 percent). Further, the location pattern of ISO certified SSIs shows that about 83 percent of the SSIs are located in Bangalore Urban district.

The ISO certification contributes to competitiveness, so these results clearly imply that (a) engineering goods have a better competitive advantage than other goods and (b) SSIs in Bangalore

Urban region have a better competitive advantage than the SSIs in other regions in the State.

4. BUSINESS ENVIRONMENT AND COMPETITIVENESS

SSIs have to interact with the different departments of the Central and State Government for getting clearances, registrations and connections. These interactions are costly in terms time, labour and money. Further, any delay in getting clearances from the administrative regulations adds to these costs. A congenial business environment should aim at minimising these costs of interactions and facilitate for higher productivity and competitiveness of SSIs in the State. The extent of delay in obtaining the required administrative clearances and permissions is analysed below by regions to assess the impact of business environment on inter-regional competitiveness of SSIs in the State.

4.1. Bangalore Urban region

Table 16 presents the indicators of business environment for Bangalore Urban region. A large number of SSIs have experience delay in obtaining credit sanctioned from banks (54.3 percent), getting power connection (32.6 percent), getting duty-drawbacks (29 percent), clearance for exports (28 percent) and water connection (21 percent). The extent of delay is:

- more than one year in obtaining clearances for exports (16 percent of units) and in getting duty-drawbacks (10 percent of units);

*Table 16: Business Environment and Competitiveness
in Bangalore Urban region*

Nature of permission or clearance required	No. of units that experienced delay ¹⁶	Duration of delay			
		One week	One month	One year	Over one year
1. Permission to expansion and diversification	38 (27.5)	0 (0)	3 (2.1)	10 (7.2)	26 (18.8)
2. Sanction of subsidy	15 (9.4)	0 (0)	1 (0.7)	9 (6.5)	8 (5.7)
3. Release of subsidy	10 (7.2)	0 (0)	1 (0.7)	3 (2.1)	7 (5)
4. Clearances for exports	39 (28.2)	1 (0.7)	2 (1.4)	15 (9.4)	22 (15.9)
5. Clearances for imports	25 (18.1)	0 (0)	6 (4.3)	12 (8.6)	9 (6.5)
6. Power connection	45 (32.6)	1 (0.7)	33 (23.9)	12 (8.6)	1 (0.7)
7. Water connection	30 (21.7)	3 (2.1)	25 (18.1)	3 (2.1)	0 (0)
8. Clearance from pollution control board	29 (21)	1 (0.7)	6 (4.3)	20 (14.4)	4 (2.8)
9. Temporary registration	16 (11.5)	2 (1.4)	11 (7.9)	5 (3.6)	0 (0)
10. Permanent registration	16 (11.5)	1 (0.7)	8 (5.7)	7 (5)	0 (0)
11. Registration under Factories Act	16 (11.5)	0 (0)	3 (2.1)	13 (9.4)	3 (2.1)
12. Getting credit sanction from banks	75 (54.3)	2 (1.4)	18 (13)	41 (29.7)	15 (9.4)
13. Getting tax- and duty-drawback	40 (28.9)	0 (0)	5 (3.6)	19 (13.7)	14 (10.1)

Note and source: Same as in [Table 6](#).

- one year in getting credit sanctioned by banks (30 percent of units), getting duty-drawbacks (14 percent of units) and clearances from pollution control (14 percent of units);
- one month in getting power connection (23.9 percent of units), water connection (18.1 percent of units) and credit sanctioned from banks (13 percent of units); and
- one week in getting water connection (2.1 percent of units).

¹⁶ Total number of sample units =138.

4.2. Northern and Coastal region

Indicators of business environment for Northern and Coastal region are presented in Table 17. Delay is experienced in obtaining credit sanctioned from banks by 81.9 percent of units, sanction of subsidy by 59 percent of units, release of subsidy by 50.4 percent of units), getting power connection by 42.85 percent of units, water connection by 35.23 percent of units and in getting permanent registration by 34.2 percent of units. Extent of delay is:

Table 17: Business Environment and Competitiveness in Northern and Coastal Region

Nature of permission or clearance required	No. of units that experienced delay ¹⁷	Duration of delay			
		One week	One month	One year	Over one year
1. Permission to expand and diversification	49 (46.6)	0 (0)	0 (0)	16 (15.2)	33 (31.4)
2. Sanction of subsidy	62 (59)	0 (0)	3 (2.8)	8 (7.6)	51 (48.5)
3. Release of subsidy	53 (50.4)	0 (0)	0 (0)	4 (3.8)	49 (46.6)
4. Clearances for exports	19 (18)	0 (0)	1 (0.9)	2 (1.9)	16 (15.2)
5. Clearances for imports	14 (13.3)	0 (0)	2 (1.9)	1 (0.9)	11 (10.4)
6. Power connection	45 (42.85)	4 (3.8)	22 (20.9)	16 (15.2)	2 (1.9)
7. Water connection	37 (35.23)	4 (3.8)	18 (17.1)	12 (11.4)	2 (1.9)
8. Clearance from pollution control board	38 (36.1)	0 (0)	2 (1.9)	14 (13.3)	20 (19)
9. Temporary registration	26 (24.7)	2 (1.9)	12 (11.4)	10 (9.5)	1 (0.9)
10. Permanent registration	36 (34.2)	1 (0.9)	10 (9.5)	17 (16.1)	8 (7.6)
11. Registration under Factories Act	8 (7.61)	0 (0)	0 (0)	4 (3.8)	4 (3.8)
12. Getting credit sanction from banks	86 (81.9)	0 (0)	4 (3.8)	20 (19)	62 (59)
13. Getting tax and duty-drawback	20 (19)	1 (0.9)	0 (0)	7 (6.6)	11 (10.4)

Note and source: Same as in Table 6.

¹⁷ Total number of sample units=105.

- more than one year in obtaining credit sanctioned from banks (59 percent of units), sanction of subsidy (49 percent of units), release of subsidy (47 percent of units), permission to expand and diversify production activities (31.4 percent of units) and clearances for exports (15.2 percent of units);
- one year in getting credit sanctioned by banks (19 percent of units), getting permanent registration (16.1 percent of units), power connection (15.2 percent of units) and clearances from pollution control (13.3 percent of units);
- one month in getting power connection (20.9 percent of units), water connection (17.1 percent of units), temporary registration (11.4 percent of units) and permanent registration (9.5 percent of units); and
- one week in getting power connection (3.8 percent of units) and water connection (3.8 percent of units).

4.3. Southern region

Table 18 presents the indicators of business environment for the Southern region. As in the case of other regions, the highest delay is experienced in obtaining credit sanctioned from banks (89.2 percent of units). On the other hand, unlike in other regions, delay is experienced in obtaining permission for expansion and diversification (51.5 percent of units), sanction of subsidy (40 percent of units), release of subsidy (34.6 percent of units), getting power connection (31.5 percent of units), clearance for exports (24.6 percent of units), permanent registration (24.6 percent of units) and water connection (20.7 percent of units). In contrast with other regions, the extent of delay is:

- more than one year in obtaining credit sanctioned from banks (33 percent of units), release of subsidy (31.5 percent of units), permission to expand and diversify production activities (26.9

- percent of units), sanction of subsidy (17.6 percent of units) and clearances for exports (11.5 percent of units);
- one year in getting credit sanctioned by banks (43 percent of units), sanction of subsidy (21.5 percent of units), permission for expansion and diversification (19.2 percent of units) and clearance for exports and water connection (12.3 percent of units);

Table 18: Business Environment and Competitiveness in Southern Region

Nature of permission or clearance required	No. of Units that experienced delay ¹⁸	Duration of delay			
		One week	One month	One year	Over one year
1. Permission to expand and diversification	67 (51.5)	2 (1.5)	7 (5.3)	25 (19.2)	35 (26.9)
2. Sanction of subsidy	52 (40)	2 (1.5)	3 (2.3)	28 (21.5)	23 (17.6)
3. Release of subsidy	45 (34.6)	1 (0.7)	3 (2.3)	4 (3.0)	41 (31.5)
4. Clearances for exports	32 (24.6)	0 (0)	5 (3.8)	16 (12.3)	15 (11.5)
5. Clearances for imports	5 (3.8)	0 (0)	11 (8.4)	2 (1.5)	0 (0)
6. Power connection	41 (31.5)	3 (2.3)	28 (21.5)	13 (10)	0 (0)
7. Water connection	27 (20.7)	1 (0.7)	7 (5.3)	16 (12.3)	7 (5.3)
8. Clearance from pollution control board	23 (17.6)	2 (1.5)	9 (6.9)	15 (11.5)	2 (1.5)
9. Temporary registration	27 (20.8)	4 (3.0)	10 (7.6)	14 (10.7)	2 (1.5)
10. Permanent registration	32 (24.6)	6 (4.6)	10 (7.6)	15 (11.5)	5 (3.8)
11. Registration under Factories Act	3 (2.3)	1 (0.7)	4 (3.0)	2 (1.5)	1 (0.7)
12. Getting credit sanction from banks	116 (89.2)	3 (2.3)	14 (10.7)	56 (43)	43 (33)
13. Getting tax and duty-drawback	31 (23.8)	3 (2.3)	12 (9.2)	4 (3.0)	11 (8.4)

Note and source: Same as in Table 6.

- one month in getting power connection (21.5 percent of units), credit sanctioned from banks (10.7 percent of units), duty-

¹⁸ Total number of sample units =130.

drawbacks (9.2 percent of units) and clearance for imports (8.4 percent of units); and

- one week in getting permanent registration (4.6 percent of units) and temporary registration (3 percent of units).

The analysis above indicates that, in general, SSIs have experienced delay in getting credit sanctioned from banks, getting tax- and duty-drawbacks, temporary and permanent registration, clearances for exports, permission for expansion and diversification, power and water connections, and clearance from the pollution control board. Many of these delays are attributable to the working of the departments in the State Government. Thus, the State Government has a major role in reducing the burden of administrative regulations and delays for improving the business environment and, hence, the competitiveness of SSIs in the State.¹⁹

¹⁹ This role of State Government has been emphasised in studies on determinants of investment into the State. For instance, Paul (2000) has brought out the enabling and disabling factors for industrial investment in Karnataka State. The study is based on responses of 22 large scale projects (*i.e.*, size of investment is more than Rs.500 million) and 75 medium scale projects (*i.e.*, size of investment is less than Rs.500 million). Although the study did not include investment in SSIs, the results are of general relevance and importance for all industries in Karnataka. For instance, the results of Paul's study reveal relative ranking of factors under infrastructure category, (*i.e.*, investors are most dissatisfied with roads, power, water and telecommunications) and non-infrastructure category (*i.e.*, investors are most dissatisfied with corruption, interaction with government, taxation, and manpower availability). Thus, Paul (2000) concludes that "the real test of the long term competitiveness of a state is in the quality of the environment it creates for investment."

5. INFRASTRUCTURE FACILITIES,
BUSINESS ENVIRONMENT AND COMPETITIVENESS
Supportive and Additional Evidence From International Survey

The World Bank's World Business Environment Survey (WBES) was conducted over a period of 20 months from the end of 1998 to the middle of 2000. The Survey covered 10000 firms in 80 countries, including India. The methodology and results of the WBES are elaborated by regions and countries in [Batra *et al.* \(2003\)](#).

WBES results for India are presented below for the purpose of providing with supportive and additional evidence for the results obtained in this paper. This supportive evidence is especially relevant, because the sample firms in the WBES did comprise at least 15 percent of units (a) in the small category (fewer than 50 employees); (b) which exported at least 20 percent of units of their output; (c) located in small towns (or rural areas) with population of fewer than 50,000 and (d) manufacturing companies.

In addition, WBES results for India and China PR (or, in brief, China) are compared below. This comparison is relevant on the following grounds. First, India and China have initiated economic reforms, but China started reform (in 1978) earlier to India (in 1991). In both countries, reforms aim at, among others, improving infrastructure facilities and business environment. Second, both India and China have a large number of small-scale industries. The products of these industries compete in international markets, such as textiles, electrical and electronics, handicrafts, consumer durables, and engineering goods. Third, both countries aim at greater inflow of foreign investment, including in the small-scale industrial sector, by creating congenial investment climate through improvement in business environment. Thus, a comparison between India and China has implications for

understanding their relative competitiveness, as it is related to infrastructure facilities and business environment.

Table 19 presents the eight broad categories of indicators of infrastructure facilities and business environment for India and China, *viz.*, General constraints to operation and growth, Taxes and regulatory constraints, Obstacles to firm financing, Sources of fixed investment, Policy instability, Corruption, Quality of public services, and Efficiency of government in delivering services. The results clearly indicate that India's infrastructure facilities and business environment are relatively poorer than those of China, except in regard to (a) financing, (b) business registration, (c) access to credit, and (d) retained earnings. Quality of the business environment in regard to policy instability, quality of Government service, and efficiency of government delivery services were not asked in China, because of government censorship policies.²⁰

The above results of the WBES survey have two important implications. First, the WBES results offer supportive evidence (*i.e.*, in regard to obstacles to firm financing and quality of public services) for the sample survey results in this paper. The supportive evidence emphasises the need for regional policy initiatives for global competitiveness of SSIs in the State, as most of the infrastructure, public services, taxes and regulations for SSIs are in the hands of the State Government. Second, the WBES results offer additional evidence on business environment, especially in regard to corruption and policy instability. These implications underline the areas for policy initiatives to improving the global competitiveness of Indian industries in general and SSIs in particular.

²⁰ Most recently, the World Bank Investment Climate Surveys in 2002-03 (World Bank 2004a) show corruption as a major constraint for a greater number of firms in India (37.4 percent) than in China (27.3 percent).

Table 19: *Quality of Business Environment in India and China, 2000*

Indicators of quality of business environment	India	China
1. General constraints on operation and growth – Percent of firms ranking constraints as a “moderate” or “major” obstacle		
1.1. Infrastructure	61.98	30.69
1.2. Financing	52.13	80.20
1.3. Taxes and regulations	39.23	28.71
1.4. Corruption	60.43	31.25
1.5. Policy instability	62.96	41.00
1.6. Inflation	67.91	42.42
2. Taxes and regulatory constraints - Percent of firms ranking constraints as a “moderate” or “major” obstacle		
2.1. Business registration	26.18	27.72
2.2. Customs	50.27	21.05
2.3. Labour	63.68	16.00
2.4. High taxes	67.86	50.00
2.5. Tax administration	41.15	30.00
3. Obstacles to firm financing – Percent of firms ranking constraints as a “moderate” or “major” obstacle		
3.1. Collateral	50.53	20.20
3.2. Bank paperwork	50.53	29.00
3.3. High interest rates	81.18	35.35
3.4. Access to credit	32.12	44.44
4. Sources of fixed investment – Percent of firms’ fixed investment from each source over last 12 months		
4.1. Retained earnings	27.10	56.60
4.2. Local commercial banks	22.00	9.00
4.3. Equity	5.20	2.60
5. Policy instability – Percent of firms responding that changes in policies are “completely” or “fairly” unpredictable	49.28	24.75
6. Corruption – Percent of firms responding “always”, “mostly,” or “frequently” for it is common in their line of business to have to pay some irregular ‘additional payments’ to get things done	54.90	Not asked

Indicators of quality of business environment	India	China
7. Quality of public services – Percent of firms rating agencies as “bad,” “very bad,” or “slightly bad”		
7.1. Roads	68.53	22.47
7.2. Telephones	26.24	14.14
7.3. Power	40.30	14.74
7.4. Water	29.63	12.64
7.5. Health	48.17	30.77
7.6. Government	40.35	Not asked
8. Efficiency of government delivery services – Percent of firms rating government service delivery as “mostly inefficient,” “inefficient,” or “very inefficient”	54.90	Not asked

Source: Compiled from [Batra *et al.* \(2003\)](#).

6. CONCLUSIONS AND POLICY IMPLICATIONS

This paper has analysed the importance of infrastructure facilities and business environment for competitiveness of SSIs. The focus on infrastructure facilities is on quality and cost in regard to transport, market information, credit, power, water, telecom and technology upgradation facilities. Business environment emphasises delay in obtaining required administrative permissions and clearances from the Government agencies. The database for analyses comprises primary and secondary data. Primary data were collected from a random sample survey of 373 SSIs in Karnataka State to assess the nature and impact of infrastructure facilities and business environment on competitiveness from the viewpoint of demanders. Throughout, the data descriptions and analyses are carried out by three sub-regions within the State for the purpose of deriving implications for inter-regional competitiveness of SSIs. In addition, the results of this

paper are compared with the World Bank Business Environment Survey results for India and China to underline the supportive and additional evidence on the role of infrastructure facilities and business environment on global competitiveness of SSIs.

The main conclusions of this paper are:

- Poor quality and high cost infrastructure in regard to transport, power, road, and credit and telecom affect competitiveness. Further, competitiveness is affected by lack of technology upgradation, relevant market information, especially under WTO regime, and coverage of ISO certification. These effects are less severe in the Bangalore region than in other regions.
- Considerable delay is experienced by SSIs in getting credit sanctioned from banks, tax and duty-drawbacks, temporary and permanent registration, clearances for exports, permission for expansion and diversification, power and water connections, and clearance from pollution control board. Other things being equal, these delays reduce the competitiveness of SSIs by adding costs. Thus, elimination of these delays is beneficial to improving competitiveness from the cost side.
- Infrastructure facilities and business environment have differential effects on competitiveness of SSIs in different regions. In the long run, this will have uneven impact on both survival and growth of SSIs and, hence, on imbalanced growth of industrial development.
- Comparison with results of the World Bank Business Environment Survey for India and China offer both supportive and additional evidence for the role of infrastructure facilities and business environment on global competitiveness of SSIs. The supportive evidence is related to the obstacles to firm financing and quality of public services, and additional evidence is related to problems of corruption and policy instability.

The above conclusions have the following major policy implications:

- Infrastructure facilitates and business environment affect competitiveness of SSIs by their specific components and by different regions in the State. Thus, component-specific and region-specific improvements are essential for enhancing of competitiveness of SSIs. This will go a long way in reduction of inter-regional disparities in the process of industrial development.
- Poor business environment is largely contributed by delay in obtaining required clearances and permissions from the State Government. Thus, the State Government has a major role in reducing the burden of administrative regulations and delays for improving the business environment and competitiveness of SSIs. A good beginning in this direction is evident in the Karnataka's New Industrial Policy 2001- 2006, and Karnataka Industries (Facilitation) Bill 2002.²¹ Nevertheless, much needs

²¹ For instance, Karnataka's New Industrial Policy 2001-2006 ([Government of Karnataka 2001](#)) has several measures for SSIs, including technology up-gradation, infrastructure support, human resource development, deregulation of business environment, marketing assistance, fiscal and non-fiscal incentives and concessions for production and marketing (domestic and export). On the other hand, the Bill aims at promoting industrial development by simplifying regulations and procedures for investors and, thereby, creates congenial business environment and investment climate in the State. The Bill provides for constitution of a three-level clearance committee. First, High Level Clearance Committee at the State level for investments over Rs.500 million. Second, Single Window Clearance Committee at the State level for investments of higher than Rs.30 million but less than or equal to Rs.500 million. Third, Single Window Clearance Committee at the district level for investments of less than or equal to Rs.30 million. According to the Bill, clearances means "grant or issue of no-objection certificate, allotment consents, approvals, permissions, registration, enrolments, licenses and the like." All clearances by the committee are binding on the respective departments of the State Government. Regulatory

to done in improving both infrastructure facilities and business environment in relation to competitors at the national and global levels.

- WTO-related information is essential for design of globally competitive marketing strategies by the SSIs. A mere awareness of the provisions of WTO may not help the SSIs to improving their competitiveness. Rather, the SSIs should be equipped with specific-impact analysis of the WTO agreements on their respective products.
- Supportive and additional evidence from the WBES emphasise the need for regional policy initiatives for global competitiveness of SSIs, as most of the infrastructure, public services, taxes and regulations for SSIs are in the hands of the State Government. In addition, the WBES results offer additional evidence on business and investment climate in the State. This underlines the areas for urgent national and State level policy initiatives to improving the global competitiveness of industries in general and SSIs in particular.
- Quantitative evaluation of monetary costs and benefits of infrastructure facilities and business environment is not attempted in this paper, as the primary data collection in section 2 was not designed to get information on them. However, this evaluation is a policy imperative. This should be attempted in future studies by appropriate design and collection of primary data collection from SSIs.²²

and procedural simplifications include provision for Combined Application Form and rationalisation of inspections by various authorities.

²² For instance, the World Bank Investment Climate Survey 2002-03 ([World Bank 2004a](#)) questionnaire offers valuable guidance for collection of data on cost of (a) contract enforcement difficulties; (b) regulation; (c) bribes; (d) crime; and (d) unreliable infrastructure. Cost of these barriers to competition is measured either in monetary terms (*e.g.*, as a percent of sales) or in terms of time. A comparison of these costs between India and China is provided in [World](#)

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